Correlation of *Nelson Mathematics 8* to The Ontario Curriculum Grades 1-8 Mathematics – Revised 2005

Number Sense and Numeration: Grade 8

Overall Expectations	**Nelson Mathematics 8**
represent, compare, and order equivalent representations of numbers, including those involving positive exponents	1.5
solve problems involving whole numbers, decimal numbers, fractions, and integers, using a variety of computational strategies	1.9, 2.2, Chapter 3 Mental Math, 6.1, 6.8, Chapter 6 Mental Math, Chapter 8 Mental Math, 9.2, 9.3, 9.5, 9.6, Chapter 9 Curious Math, 9.9, Chapter 9 Math Game. 9.10, Chapter 12 Curious Math
solve problems by using proportional reasoning in a variety of meaningful contexts	2.4
Specific Expectations	
Quantity Relationships	
express repeated multiplication using exponential notation (e.g., $2 \times 2 \times 2 \times 2 = 24$)	1.4
represent whole numbers in expanded form using powers of ten (e.g., $347 = 3 \times 10^2 + 4 \times 10^1 + 7$)	1.5, Chapter 1 Task
represent, compare, and order rational numbers (i.e., positive and negative fractions and decimals to thousandths)	2.1, Chapter 2 Curious Math, 2.6, Chapter 9 Mental Imagery, 9.4
translate between equivalent forms of a number (i.e., decimals, fractions, percents) (e.g., 3/4 = 0.75)	2.1, 2.4, Chapter 2 Mental Math, Chapter 2 Math Games, 2.7
determine common factors and common multiples using the prime factorization of numbers (e.g., the prime factorization of 12 is $2 \times 2 \times 3$; the prime factorization of 18 is $2 \times 3 \times 3$; the greatest common factor of 12 and 18 is 2×3 or 6; the least common multiple of 12 and 18 is $2 \times 2 \times 3 \times 3$ or 36)	1.1, 1.2, 1.3, Chapter 1 Math Game, Chapter 1 Task
Operational Sense	
solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools (e.g., graphs, calculators) and strategies (e.g., estimation, algorithms)	2.1, 2.2, 2.3, 2.4, 2.8, 2.9, Chapter 4 Curious Math, 5.5, Chapter 12 Math Game
solve problems involving percents expressed to one decimal place (e.g., 12.5%) and whole-number percents greater than 100 (e.g.,115%)	2.7, 2.8, Chapter 5 Mental Imagery
use estimation when solving problems involving operations with whole numbers, decimals, percents, integers, and fractions, to help judge the reasonableness of a solution	1.6, 1.8, 1.9, 2.2, 2.7, Chapter 5 Math Game, 6.2, Chapter 6 Mental Math, 8.4, Chapter 12 Mental Math
represent the multiplication and division of fractions, using a variety of tools and strategies (e.g., use an area model to represent 1/4 multiplied by 1/3	9.5, 9.6, 9.7, Chapter 9 Curious Math, 9.8, Chapter 9 Task
solve problems involving addition, subtraction, multiplication, and division with simple fractions	9.1, 9.3, 9.4, 9.5, 9.6, 9.9
represent the multiplication and division of integers, using a variety of tools [e.g., if black counters represent positive amounts and red counters represent negative amounts, you can model $3 \times (-2)$ as three groups of two red counters]	6.3, 6.4, 6.5, 6.6
solve problems involving operations with integers, using a variety of tools (e.g., two colour counters, virtual manipulatives, number lines)	6.7
evaluate expressions that involve integers, including expressions that contain brackets and exponents, using order of operations	6.7

multiply and divide decimal numbers by various powers of ten (e.g., "To convert 230 000 cm^3 to cubic metres, I calculated in my head 230 000 ÷ 106 to get 0.23 m^3.")	Chapter 1 Mental Math, 2.2
estimate, and verify using a calculator, the positive square roots of whole numbers, and distinguish between whole numbers that have whole-number square roots (i.e., perfect square numbers) and those that do not	Chapter 1 Curious Math, 1.6, 1.7, Chapter 10 Mental Math
Proportional Relationships	
identify and describe real-life situations involving two quantities that are directly proportional (e.g., the number of servings and the quantities in a recipe, mass and volume of a substance, circumference and diameter of a circle)	2.4, 5.3
solve problems involving proportions, using concrete materials, drawings, and variables	2.4, 2.7
solve problems involving percent that arise from real-life contexts (e.g., discount, sales tax, simple interest)	2.8, 2.9, Chapter 2 Task, Chapter 3 Curious Math, Chapter 3 Cross-Strand Investigation
solve problems involving rates	2.5

Measurement: Grade 8

Overall Expectations	**Nelson Mathematics 8**
research, describe, and report on applications of volume and capacity measurement	11.3, Chapter 11 Task
determine the relationships among units and measurable attributes, including the area of a circle and the volume of a cylinder	5.1, 5.4, 5.5, 11.3, Chapter 11 Math Game
Specific Expectations	
Attributes, Units, and Measurement Sense	
research, describe, and report on applications of volume and capacity measurement (e.g., cooking, closet space, aquarium size)	11.3, Chapter 11 Task
Measurement Relationships	
solve problems that require conversions involving metric units of area, volume, and capacity (i.e., square centimetres and square metres; cubic centimetres and cubic metres; millilitres and cubic centimetres)	11.3
measure the circumference, radius, and diameter of circular objects, using concrete materials	5.1, 5.2, Chapter 5 Task
determine, through investigation using a variety of tools (e.g., cans and string, dynamic geometry software) and strategies, the relationships for calculating the circumference and the area of a circle, and generalize to develop the formulas [i.e., Circumference of a circle = $\pi \times$ diameter; Area of a circle = $\pi \times (\text{radius})^2$]	5.3, 5.4, 5.5
solve problems involving the estimation and calculation of the circumference and the area of a circle	5.1, 5.2, 5.3, 5.4, 5.5
determine, through investigation using a variety of tools and strategies (e.g., generalizing from the volume relationship for right prisms, and verifying using the capacity of thin-walled cylindrical containers), the relationship between the area of the base and height and the volume of a cylinder, and generalize to develop the formula (i.e., Volume = area of base $\times$ height)	11.3
determine, through investigation using concrete materials, the surface area of a cylinder	11.1, 11.2
solve problems involving the surface area and the volume of cylinders, using a variety of strategies	11.2, 11.3. 11.4, Chapter 11 Task

Geometry and Spatial Sense: Grade 8

Overall Expectations	**Nelson Mathematics 8**
demonstrate an understanding of the geometric properties of quadrilaterals and circles and the applications of geometric properties in the real world	10.1, 10.4
develop geometric relationships involving lines, triangles, and polyhedra, and solve problems involving lines and triangles	10.2, 10.3, 10.5, 11.6
represent transformations using the Cartesian coordinate plane, and make connections between transformations and the real world	7.1, 7.2, 7.3, 7.5, Chapter 7 Curious Math, Chapter 7 Math Game, Chapter 7 Task
Specific Expectations	
Geometric Properties	
sort and classify quadrilaterals by geometric properties, including those based on diagonals, through investigation using a variety of tools (e.g., concrete materials, dynamic geometry software)	10.4
construct a circle, given its centre and radius, or its centre and a point on the circle, or three points on the circle	5.1, 5.2, 10.1
investigate and describe applications of geometric properties (e.g., properties of triangles, quadrilaterals, and circles) in the real world	5.2, 5.3, 5.4, 5.5, 5.6, Chapter 5 Math in Action, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, Chapter 10 Task, Chapter 10 Math in Action
Geometric Relationships	
determine, through investigation using a variety of tools (e.g., dynamic geometry software, concrete materials, geoboard), relationships among area, perimeter, corresponding side lengths, and corresponding angles of similar shapes	7.4
determine, through investigation using a variety of tools (e.g., dynamic geometry software, concrete materials, protractor) and strategies (e.g., paper folding), the angle relationships for intersecting lines and for parallel lines and transversals, and the sum of the angles of a triangle	10.2, 10.3
solve angle-relationship problems involving triangles (e.g., finding interior angles or complementary angles), intersecting lines (e.g., finding supplementary angles or opposite angles), and parallel lines and transversals (e.g., finding alternate angles or corresponding angles)	10.2, Chapter 10 Math in Action
Geometric Relationships (continued)	
determine the Pythagorean relationship, through investigation using a variety of tools (e.g., dynamic geometry software; paper and scissors; geoboard) and strategies	Chapter 10 Curious Math, 10.6
solve problems involving right triangles geometrically, using the Pythagorean relationship	10.6, Chapter 10 Math Game, Chapter 10 Task, Chapter 10 Math in Action
determine, through investigation using concrete materials, the relationship between the numbers of faces, edges, and vertices of a polyhedron (i.e., number of faces+ number of vertices= number of edges+ 2)	11.5, 11.6
Location and Movement	
graph the image of a point, or set of points, on the Cartesian coordinate plane after applying a transformation to the original point(s) (i.e., translation; reflection in the *x*-axis, the *y*-axis, or the angle bisector of the axes that passes through the first and third quadrants; rotation of 90°, 180°, or 270°about the origin)	7.1, 7.2, 7.3
identify, through investigation, real-world movements that are translations, reflections, and rotations	Chapter 7 Task

Patterning and Algebra: Grade 8

Overall Expectations	**Nelson Mathematics 8**
represent linear growing patterns (where the terms are whole numbers) using graphs, algebraic expressions, and equations	4.2, 4.5
model linear relationships graphically and algebraically, and solve and verify algebraic equations, using a variety of strategies, including inspection, guess and check, and using a "balance" model	4.2, 8.1, 8.4, 8.5, 8.6, Chapter 8 Task, Chapter 8 Math in Action
Specific Expectations	
Patterns and Relationships	
represent, through investigation with concrete materials, the general term of a linear pattern, using one or more algebraic expressions (e.g., "Using toothpicks, I noticed that 1 square needs 4 toothpicks, 2 connected squares need 7 toothpicks, and 3 connected squares need 10 toothpicks. I think that for n connected squares I will need $4 + 3(n - 1)$ toothpicks, because the number of toothpicks keeps going up by 3 and I started with 4 toothpicks. Or, if I think of starting with 1 toothpick and adding 3 toothpicks at a time, the pattern can be represented as $1 + 3n$.")	4.3
represent linear patterns graphically (i.e., make a table of values that shows the term number and the term, and plot the coordinates on a graph), using a variety of tools (e.g., graph paper, calculators, dynamic statistical software)	4.5
determine a term, given its term number, in a linear pattern that is represented by a graph or an algebraic equation	4.3, Chapter 4 Task
Variables, Expressions, and Equations	**Nelson Mathematics 8**
describe different ways in which algebra can be used in real-life situations (e.g., the value of $5 bills and toonies placed in a envelope for fund raising can be represented by the equation $v = 5f + 2t$)	8.2
model linear relationships using tables of values, graphs, and equations (e.g., the sequence 2, 3, 4, 5, 6, ..., can be represented by the equation $t = n + 1$, where n represents the term number and t represents the term), through investigation using a variety of tools (e.g., algebra tiles, pattern blocks, connecting cubes, base ten materials)	8.1
translate statements describing mathematical relationships into algebraic expressions and equations (e.g., for a collection of triangles, the total number of sides is equal to three times the number of triangles or $s = 3n$)	4.1, 4.2, 8.1, 8.2, 8.3
evaluate algebraic expressions with up to three terms, by substituting fractions, decimals, and integers for the variables (e.g., evaluate $3x + 4y = 2z$, where $x = 1/2$, $y = 0.6$, and $z = -1$)	Chapter 8 Curious Math, 8.3, Chapter 8 Math Game
make connections between solving equations and determining the term number in a pattern, using the general term (e.g., for the pattern with the general term $2n + 1$, solving the equation $2n + 1 = 17$ tells you the term number when the term is 17)	8.1
solve and verify linear equations involving a one-variable term and having solutions that are integers, by using inspection, guess and check, and a "balance" model	8.4, 8.5, 8.6

Data Management and Probability: Grade 8

Overall Expectations	**Nelson Mathematics 8**
collect and organize categorical, discrete, or continuous primary data and secondary data and display the data using charts and graphs, including frequency tables with intervals, histograms, and scatter plots	3.3, 3.4
apply a variety of data management tools and strategies to make convincing arguments about data	3.3, 34
use probability models to make predictions about real-life events	12.5, 12.6, Chapter 12 Task
Specific Expectations	
Collection and Organization of Data	
collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements	3.2, 3.6, Chapter 3 Task
organize into intervals a set of data that is spread over a broad range (e.g., the age of respondents to a survey may range over 80 years and may be organized into ten-year intervals)	3.4
collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools), and display the data in charts, tables, and graphs (including histograms and scatter plots) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software)	3.1, 3.4
select an appropriate type of graph to represent a set of data, graph the data using technology, and justify the choice of graph (i.e., from types of graphs already studied, including histograms and scatter plots)	3.1, 3.4
explain the relationship between a census, a representative sample, sample size, and a population (e.g., "I think that in most cases a larger sample size will be more representative of the entire population.")	3.2
Data Relationships	**Nelson Mathematics 8**
read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., election data or temperature data from the newspaper, data from the Internet about lifestyles), presented in charts, tables, and graphs (including frequency tables with intervals, histograms, and scatter plots)	3.1, 3.2, 3.3, 3.4
determine, through investigation, the appropriate measure of central tendency (i.e., mean, median, or mode) needed to compare sets of data (e.g., in hockey, compare heights or masses of players on defence with that of forwards)	3.5, Chapter 3 Math Game
demonstrate an understanding of the appropriate uses of bar graphs and histograms by comparing their characteristics	3.4
compare two attributes or characteristics (e.g., height versus arm span), using a scatter plot, and determine whether or not the scatter plot suggests a relationship	3.1
identify and describe trends, based on the rate of change of data from tables and graphs, using informal language (e.g., "The steep line going upward on this graph represents rapid growth. The steep line going downward on this other graph represents rapid decline.")	4.5

make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs	3.1, 3.2, 3.3, 3.4
compare two attributes or characteristics, using a variety of data management tools and strategies (i.e., pose a relevant question, then design an experiment or survey, collect and analyse the data, and draw conclusions)	3.4, 3.6, Chapter 3 Task
Probability	
compare, through investigation, the theoretical probability of an event (i.e., the ratio of the number of ways a favourable outcome can occur compared to the total number of possible outcomes) with experimental probability, and explain why they might differ.	12.1, 12.2, 12.3
determine, through investigation, the tendency of experimental probability to approach theoretical probability as the number of trials in an experiment increases, using class-generated data and technology-based simulation models (Sample problem: Compare the theoretical probability of getting a 6 when tossing a number cube with the experimental probabilities obtained after tossing a number cube once, 10 times, 100 times, and 1000 times.)	12.2
identify the complementary event for a given event, and calculate the theoretical probability that a given event will not occur (Sample problem: Bingo uses the numbers from 1 to 75. If the numbers are pulled at random, what is the probability that the first number is a multiple of 5? is not a multiple of 5?)	12.3